

1 **AERIAL HAVING A DUAL ANTENNA SET AND A LAMP**

2 BACKGROUND OF THE INVENTION

3 1. Field of the Invention

4 The present invention relates to a multi-function TV signal receiving
5 apparatus, in particular to a TV signal receiving aerial having a dual antenna set
6 and a lamp.

7 2. Description of Related Arts

8 Households are commonly equipped with a TV signal receiving
9 apparatus that is capable of receiving audio and video channels over a wide radio
10 frequency (RF) range thus increasing the number of television channels
11 selectable.

12 A typical TV receiving aerial (70), as shown in Fig. 7, is normally placed
13 over a television set (80), having two antennas, one, in the form of a ring (72), for
14 reception of ultra high frequencies (UHF) band, and the other, in the form of a
15 straight rod (71), for reception of high frequencies (VHF) band. These two
16 antennas are linked to the television (80) through special cables. The dual-
17 antenna design of the TV receiving aerial (70) is to increase the audio and video
18 channels receivable by the receiving aerial. Conventional TV receiving aerials
19 only allow viewers to select channels 1-13 on the television set, but by using this
20 dual antenna receiving aerial viewers will be able to select channels beyond the
21 VHF frequencies.

22 The conventional TV receiving aerial can be a hindrance to normal body
23 movement or an eyesore if the receiving aerial is not used in TV viewing. Since
24 the TV receiving aerial has to be placed at a location close to or directly over the

1 television set to remain physically connected, if the TV viewer does not select
2 wireless channels, the receiving aerial is idle sitting on top of the television set
3 and just taking up extra space.

4 The above mentioned TV receiving aerials with only a VHF band and
5 limited functions will soon become obsolete.

6 **SUMMARY OF THE INVENTION**

7 The primary object of the present invention is to provide a TV signal
8 receiving aerial having a dual antenna set and a lamp, whereby the TV receiving
9 aerial is not only able to receive audio and video signals over a wide RF range,
10 but also has a lamp that can provide the necessary illumination when the viewer
11 tries to operate the receiving aerial at night or in the darkness.

12 The basic structure of the TV signal receiving aerial comprises:
13 a unit body or antenna holder for supporting the dual antenna set;
14 at least one light source being installed on the unit body and exposed;
15 a lamp shade being mounted over the light source and attached to the unit
16 body; and

17 a circuit board being embedded in the unit body, and interconnected by
18 the dual antenna and the light source, which is comprised of a signal processing
19 circuit and a lamp driver circuit.

20 The advantage of the present invention is that the viewer is able to use a
21 key pad installed on the unit body to select either UHF or VHF channels for
22 viewing. When the operation mode is set, the audio video signals are received
23 from the respective antennas, and then passed to the circuit board for conversion
24 to an appropriate format, and finally output through the audio and video terminals

1 to a television set for broadcasting to the viewer.

2 Another advantage of the invention is that the antenna holder is built in
3 with a lamp. When the viewer activates the lamp through the key pad control, the
4 circuit board enables the lamp driver circuit, which provides a stable DC current
5 to the light source to turn on the lamp. The addition of a lamp to the receiving
6 aerial can increase the functional value of an existing product.

7 The secondary object of the present invention is to provide an
8 aesthetically designed antenna holder that incorporates a dual antenna set and a
9 lamp, such that the lamp shape and the ring antenna are fully integrated without
10 increasing the actual size of the receiving aerial or antenna holder.

11 The lamp shade in the form of a cylinder is installed upright on the base
12 having a bevel opening at the top. The lamp shade has to be inserted through the
13 hollow space of the ring antenna and mounted on a rotatable stand, which can be
14 rotated for adjustment of the antenna position for signal reception. Since the lamp
15 shade and the ring antenna are installed on the rotatable stand coaxially, the lamp
16 shade can also be adjusted by appropriately rotating the switch stand.

17 Alternatively, the lamp shade can be shaped like a water drop or in an
18 oval shape, coinciding with the shape of the ring antenna, whereby the rim of the
19 ring antenna can be permanently attached on the outer edge of the lamp shade.
20 The integration of the lamp shade and the ring antenna on the existing antenna
21 holder can create an aesthetic impression.

22 Other objectives, advantages and novel features of the invention will
23 become more apparent from the following detailed description when taken in
24 conjunction with the accompanying drawings.

1 **BRIEF DESCRIPTION OF THE DRAWINGS**

2 Fig. 1 is a perspective view on one preferred embodiment of the
3 invention;

4 Fig. 2 is a schematic diagram of the signal processing circuit of the
5 invention;

6 Fig. 3 is a schematic diagram of the lamp driver circuit of the invention;

7 Fig. 4 is another preferred embodiment of the invention;

8 Fig. 5 is a conceptual diagram of the path of movement of the adjustable
9 antenna and the lamp shade originally shown in Fig. 4;

10 Fig. 6 is a diagram of the TV receiving aerial, in accordance with the
11 invention, being placed on a television set; and

12 Fig. 7 is a diagram of a conventional TV receiving aerial placed on a
13 television set.

14 **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

15 The present invention provides a TV signal receiving aerial having a dual
16 antenna set and a lamp built into the antenna holder. The integration of the lamp
17 and the antenna is unique in that the lamp shade is fully integrated with the ring
18 antenna without increasing the actual size of the TV receiving aerial or the
19 antenna holder.

20 The basic structure of the TV receiving aerial having a dual-antenna
21 construction and a lamp, as implemented by one embodiment of the invention, is
22 shown in Fig. 1, comprising a unit body or antenna holder (10), a ring antenna
23 (11), a straight antenna (12), a key pad (13), a base (14), a rotatable stand (15), a
24 light source (20), and a circuit board (30), wherein

1 the unit body or antenna holder (10) has the ring antenna (11), the
2 straight antenna (12), the key pad (13), the base (14) and the rotatable stand (15)
3 mounted thereon;

4 the ring antenna (11) is mounted on the rotatable stand (15), such that the
5 ring antenna (11) can be rotated in step with the rotatable stand (15) for selection
6 of audio video channels for best reception (in the present embodiment the ring
7 antenna (11) is fixed along the circular rim of a lamp shade (21));

8 the rotatable stand (15) is mounted at the center of the antenna holder and
9 surrounded by the base (14);

10 the straight antenna (12) is either mounted on the rotatable stand (15) or
11 fixed on the base (14); (in the present embodiment the straight antenna (12) is
12 held on the base (14) in a fixed position);

13 the key pad (13) is installed on the base (14) of the unit body (10),
14 through which the signal reception can be switched between wireless channels or
15 cable channels, and the lamp can be controlled;

16 at least one of the light source (20) is installed at a position exposed over
17 the base (14), which can be a light bulb or a light emitting diode (LED) (in the
18 present embodiment the light source (20) is installed at the base of the rotatable
19 stand (15));

20 the lamp shade (21), shaped like a water drop or oval shaped, is also
21 installed on the rotatable stand (15) or the base (14) for directing the light beam
22 from the light source (20) (in the present embodiment the lamp shade is mounted
23 on the rotatable stand (15));

24 the circuit board (30) is received in the unit body (10) and connected to

1 the straight antenna (12), ring antenna (11), the light source (20) and the key pad
2 (13), which is comprised of a signal processing circuit (40) and a lamp driver
3 circuit (50);

4 the signal processing circuit (40) is formed by other components as
5 shown in Fig. 2 including:

6 a high pass filter (41) being connected to the ring antenna (not shown in
7 diagram) to remove low frequency noise from the UHF signals received by the
8 TV receiving aerial;

9 a band pass filter (42) being connected to the straight antenna to extract
10 VHF signals received therefrom;

11 a signal amplifier (43) being respectively connected to the output of the
12 high pass filter and the band pass filter (41) (42) to amplify the audio video
13 signals received by the antennas to produce the required audio and video outputs;

14 a cable switch (44) being connected to the output of the signal amplifier
15 (43), a cable connector port (46) and an AV terminal (45) for switching the signal
16 reception between wireless channels or cable channels.

17 The lamp driver circuit (50), as shown in Fig.3, is formed by a voltage
18 regulator (51), where the input of the voltage regulator (51) comes from the DC
19 power supply, and the output through the key pad (13) control is connected to the
20 power of the light source (not shown in the diagram) for providing a stable DC
21 current; where the key pad (13) has a power switch to provide the necessary
22 control for turning on the light source.

23 The lamp can be activated by the key pad control (13). When the lamp is
24 on, the lamp driver circuit (50) embedded in the circuit board (30) delivers DC

1 power to the light source (20) causing the light source (20) to give out light,
2 which strikes against the lamp shade (21) and brightens the surrounding area of
3 the lamp shade (21), thus providing the background lighting for tuning the
4 receiving aerial.

5 In another embodiment of the invention, as shown in Fig. 4, the unit body
6 or antenna holder (10') has a ring antenna (11'), a straight antenna (12), a base
7 (14), a rotatable stand (15), a key pad (13), a light source (20) and a lamp shade
8 (21').

9 The form and position of all but two of the above components are the
10 same as those in the previous example, with the exception of the ring antenna
11 (11') and the lamp shade (21') wherein

12 the ring antenna (11') is fixed at a slant on the rotatable stand (15), such
13 that the ring antenna (11') can be rotated in step with the rotatable stand (15) for
14 selection of audio video channels; and

15 the lamp shade (21') is positioned at the center of the unit body or
16 antenna holder (10) in the form of a cylinder surrounding the light source (20),
17 with the top opening beveled, whereby the lamp shade (21') is mounted through
18 the central space of the ring antenna (11') and fixed on the unit body (10), having
19 the inclined angle of the ring antenna (11') to correspond with the beveled
20 opening of the lamp shade (21'), and the external form of the lamp shade (21') to
21 mesh in with the ring antenna (11').

22 When the rotatable stand (15) rotates around an axle, as shown in Fig. 5,
23 the ring antenna (11') surrounding the lamp shade (21') also turns around in step
24 with the movement of the rotatable stand (15).

1 When compared with conventional receiving aerials, as shown in Fig. 7,
2 that could only receive wireless channels, the present invention is clearly a more
3 advanced design in that the TV signal receiving apparatus is able to receive both
4 wireless and cable channels, and the antenna holder also incorporates a lamp to
5 facilitate channel tuning under the night light.

6 Furthermore, the present design has integrated a lamp and a dual antenna
7 set in the antenna holder without increasing the actual size of the TV receiving
8 aerial, as shown in Fig. 6. The TV receiving aerial can be posed as an artistic
9 decoration over a television set (60), and is not just a household appliance.

10 The foregoing description of the preferred embodiments of the present
11 invention is intended to be illustrative only and, under no circumstances, should
12 the scope of the present invention be so restricted, and changes may be made in
13 detail, especially in matters of shape, size, and arrangement of parts within the
14 principles of the invention to the full extent indicated by the broad general
15 meaning of the terms in which the appended claims are expressed.